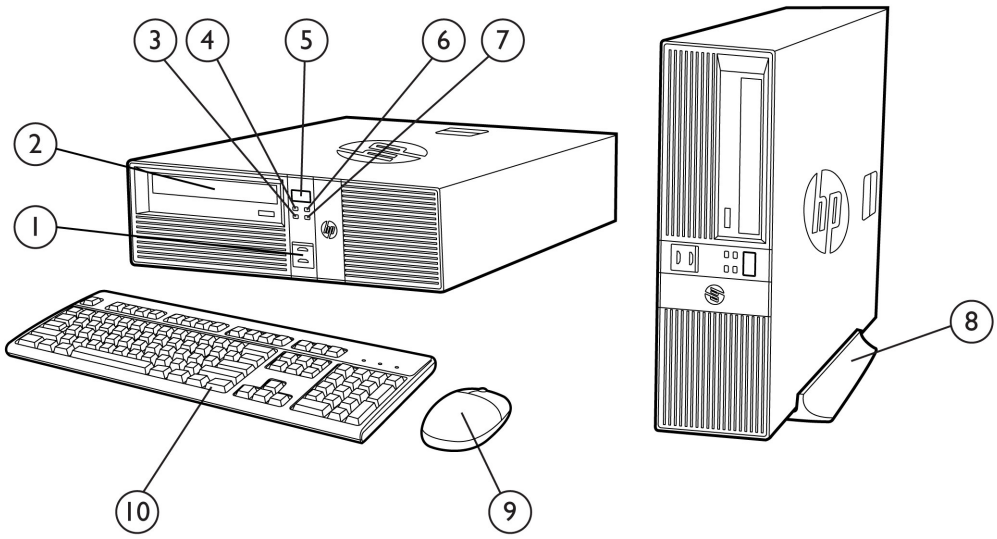
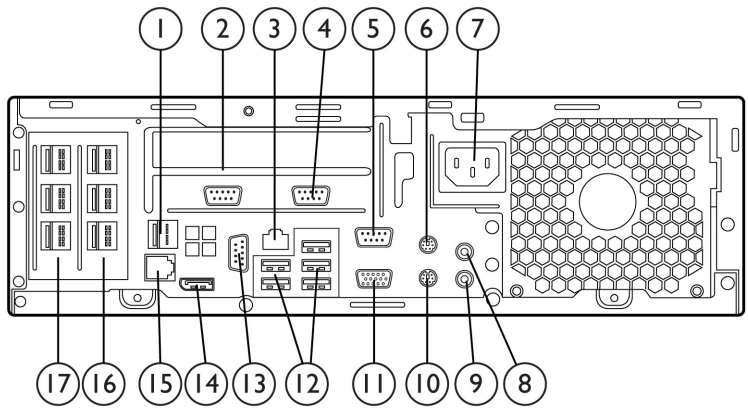
Overview



1. 2 USB 2.0 ports with sliding door
2. 5.25" external optical drive
3. NIC link indicator LED
4. Power/ Diagnostic LED
5. Power button
6. Hard Drive LED
7. NIC activity indicator LED
8. Stand for vertical configuration (optional)
9. HP 2-button scroll mouse-(optional)
10. HP Standard keyboard (optional)



1. 24 Volt USB + PWR port
2. Two (2) Full-Height Slots*. Can be configured either as two (2) PCI or two (2) PCIe x1 Full-Height slots. Shown is optional 2 Port RS232 serial (power configurable) Card, COM4 port (left) and COM3 port (right port)
3. RJ-45 LAN jack
10. PS/2 keyboard port
11. VGA port

Overview

4. RS232 serial COM3 (as described in item 2)
5. RS232 serial (power configurable) COM1 port
6. PS/2 mouse port
7. 240W EPA – Active PFC power supply (no line switching required)
8. Line in audio jack
9. Line out audio jack
12. 5 USB 2.0 ports
13. RS232 serial (power configurable) COM2 port
14. Display Port
15. RJ12 cash drawer port
16. One (1) PCIe x16 Slot* – shown is optional three (3) port 12 Volt USB +Power Card
17. One (1) PCIe x1 Slot* (shown is optional three (3) port 12 Volt USB + Power Card

*** NOTE:** A variety of cards are available to populate slots, dependant on riser choice and connectors utilized. For full details, please contact your HP sales representative for configuration choices.

At A Glance

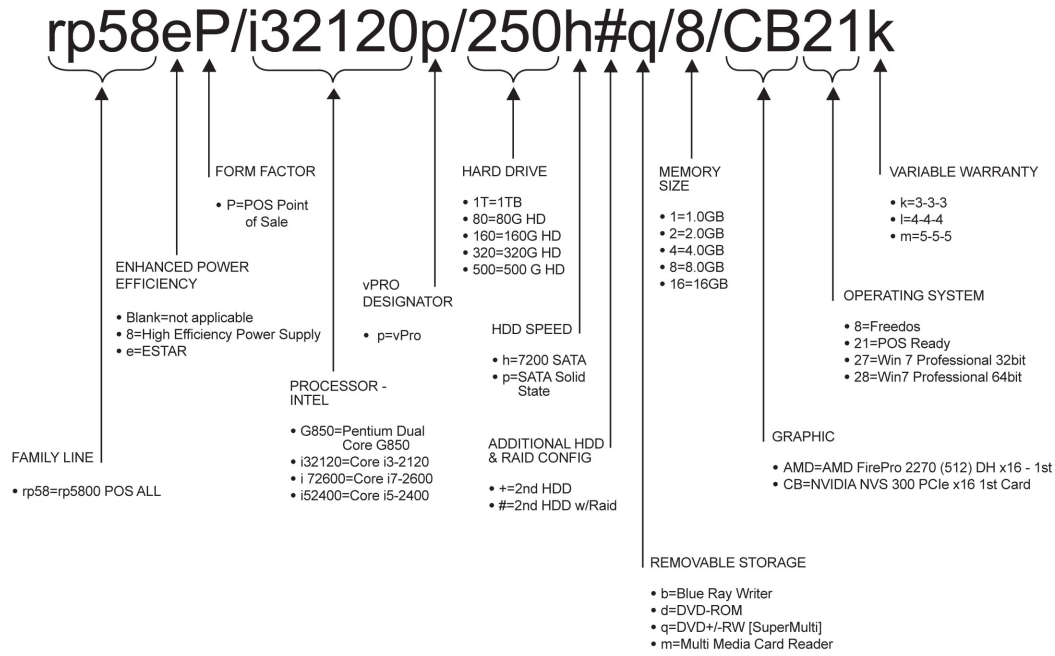
- UEFI BIOS developed and engineered by HP for better security, manageability and software image stability
- Intel Q67 Express chipset supporting Intel 2nd generation Core processors, featuring Intel HD Graphics and vPro Technology (available with select processors)
- One of the following operating systems:
  - Genuine Windows 7 Professional 32-bit
  - Genuine Windows 7 Professional 64-bit
  - Genuine Microsoft Windows Embedded POSReady 2009
  - FreeDOS
- Intel 82579LM GbE integrated network connection
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Integrated dual independent monitor support via VGA and digital DisplayPort v1.1a video interfaces
- Discrete graphics options available
- 90% high efficiency energy saving power supply
- ENERGY STAR 5.0 qualified models available (dependent upon the desired configuration)
- Can be configured with multiple hard disk drives in a RAID array
- Industry leading Design for Environment standards
- Protected by HP Services, including standard 3-3-3 warranty and warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability features for easier upgrades and repairs
- 40C ambient thermals standard. Optional 50C thermal configuration available.
- Optional HP Rear Port/Cable Control Cover Available
- Point of Sale I/O ports including cash drawer port.
  - Configurable Full-Height expansion slots Must choose either a PCI Riser or PCIe Riser. The choice of riser will affect which cards can be utilized.
  - Either the PCI Riser or the PCIe Riser contain a Serial Port Connector, and if this connector is populated by a Serial Card then one of the riser bays is covered and cannot be used

NOTE: All models and features may not be available in all countries

Standard Features and Configurable Components (availability may vary by country)

Model Key and Example

NOTE: This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.



Operating Systems

Preinstalled

Genuine Windows 7 Professional Edition (32-bit or 64-bit)
Genuine Microsoft Windows Embedded POSReady 2009
FreeDOS

Supported

Genuine Windows XP Professional Edition (32-bit)
Genuine Windows 7 Enterprise Edition*

Tested

Microsoft Windows Server 2003 R2 Standard (64-bit & 32-bit)
Microsoft Windows Server 2008 R2 Standard (64-bit)
Microsoft Windows Server 2012 R2 Standard (64-bit)

Certified

Novell SUSE Linux Enterprise Desktop†

* System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

Standard Features and Configurable Components (availability may vary by country)

† The following features are not supported by Novell SUSE Linux Enterprise Desktop:

- Intel Gigabit CT Desktop NIC
- Broadcom NetXtreme Gigabit Ethernet Plus
- HP ProtectTools
- HP Blu-ray Writer playback of commercial movies
- DisplayPort video interface
- HP 2nd serial port adapter
- Power Management features
- Systems configured with Linux do not qualify for ENERGY STAR

Value Added Software (included with all models; not included when configured with FreeDOS)

HP ProtectTools Security Suite
HP Software Management Agent
Computrace for Desktops agent
HP Vision Diagnostics
PDF Complete Corporate Edition
Microsoft Office 2010 Starter

Value Added Software (included with select models; not included when configured with FreeDOS)

HP Power Assistant v2.0
Computer Setup Utility
Norton Internet Security 2011[1]
Roxio Creator Business
Corel WinDVD

[1] 60 day trial period for Norton Internet Security 2011 software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.

HP Client Management Solutions (available for free download from the Internet)

http://www.hp.com/go/easydeploy

HP SoftPaq Download Manager
HP Client Catalog for Microsoft SMS
HP Systems Software Manager
HP Client Automation Starter

Retail Solutions Services and Features

Intel® Stable Image Platform Program (SIPP)
Intel® vPro™ Technology
HP Global Series Services
Factory Express Deployment and Lifecycle Services
Intel® Standard Manageability
Trusted Platform Module (TPM) v1.2[1]

[1] TPM module disabled where restricted by law, i.e. Russia.

Standard Features and Configurable Components (availability may vary by country)

Service and Support

On-site warranty and service[1]: This limited warranty and service offering delivers parts, labor and on-site repair for terms up to 5 years. Response time is next business day[2] and includes free telephone support[3] 24 x 7. Global coverage[2] ensures any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor.

[1] Terms and conditions may vary by country. Certain restrictions and exclusions apply
[2] On-site services may be provided pursuant to a service contract between HP and an authorized HP third party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country
[3] Technical telephone support applies only to HP configured, HP and HP qualified third party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

Chipset

Intel® Q67 Express

Processor

Intel® Pentium® Dual-Core Processors

Intel® Pentium® Dual-Core G850 Processor
2.90 GHz, 3 MB cache, 2 cores

Intel® 2nd Generation Core™ i3 Processors

Intel Core i3-2120 Processor
3.30 GHz, 3M cache, 2 cores/4 threads

Intel® 2nd Generation Core™ i5 Processors

Intel Core i5-2400 Processor
3.10 GHz, 6M cache, 4 cores/4 threads
Intel Stable Image Platform Program (SIPP)
Supports Intel vPro Technology

Intel® 2nd Generation Core™ i7 Processors

Intel Core i7-2600 Processor
3.40 GHz, 8M cache, 4 cores/8 threads
Intel Stable Image Platform Program (SIPP)
Supports Intel vPro Technology

Intel® vPro™ Technology

HP rp5800 Retail Systems featuring this technology include processors that are part of the Intel 2011 Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the HPrp5800 Retail System, thus making this model the most stable, secure, and manageable platforms available to retailers today.

Intel Advanced Management Technology (AMT) v7.0 – An advanced set of remote management features and functionality which provides network administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 7.0 includes the following advanced management functions:

- Power Management (on, off, reset)

Standard Features and Configurable Components (availability may vary by country)

- Hardware Inventory (includes BIOS and firmware revisions
- Hardware Alerting
- Agent Presence
- System Defense Filters
- SOL/IDER
- Cisco NAC/SDN Support
- ME Wake-on-LAN
- DASH 1.1 compliance
- IPv6 Support
- Fast Call for Help - a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection
- Remote Scheduled Maintenance - pre-schedule when the Retail System connects to the IT or service provider console for maintenance. Remote Retail Systems can get required patches, be inventoried, etc by connecting to their IT console or Service Provider when it's convenient
- Remote Alerts – automatically alert IT or service provider if issues arise
- Access Monitor – Provides oversight into Intel® AMT actions to support security requirements
- PC Alarm Clock
- Microsoft NAP Support
- Host Base set-up and configuration
- Management Engine (ME) firmware roll back
- Wireless AMT functionality on Point of Sale/Desktop (WoDT)
- Enhanced KVM resolution

Redundant Array of Independent Drives (RAID)

Flexible implementation:

- DriveLock is supported while in RAID mode. Users can manage the DriveLock password from within F10 Setup. Locked drives will be displayed as such in the RAID option ROM interface.
- Hard drive information can be viewed within F10 Setup while in RAID mode. Previously, the hard drives will not appear in Drive Configuration when switching to RAID mode.
- DPS Self Test can be executed on physical hard drives while in RAID mode.
- The RAID Setup Utility (accessed through CTRL-I) can be protected by the F10 Setup password.

NOTE:
RAID 1 is the only RAID configuration offered via factory configurations. The pre-configured systems:

- are complete RAID systems and have both drives installed.
- have the necessary Option ROM configuration.
- are pre-loaded and pre-installed with all required Intel software.
- include a preinstalled operating system that is mirrored mode out of the box.

Please refer to the HP White Paper titled “Advanced Host Controller Interface (AHCI) and Redundant Array of Independent Disks (RAID) on HP Compaq PCs” at: http://www.hp.com for more information and instructions.

Standard Features and Configurable Components (availability may vary by country)

DDR3 Synchronous DRAM NON-ECC System Memory

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The HP rp5800 Retail System supports non-ECC DDR3 PC3-12800 (1600 MHz) and PC3-10600 (1333 MHz) memory.

CAUTION: You must shut down the Retail System and disconnect the power cord before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the Retail System is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

Memory Configurations:

Maximum Memory

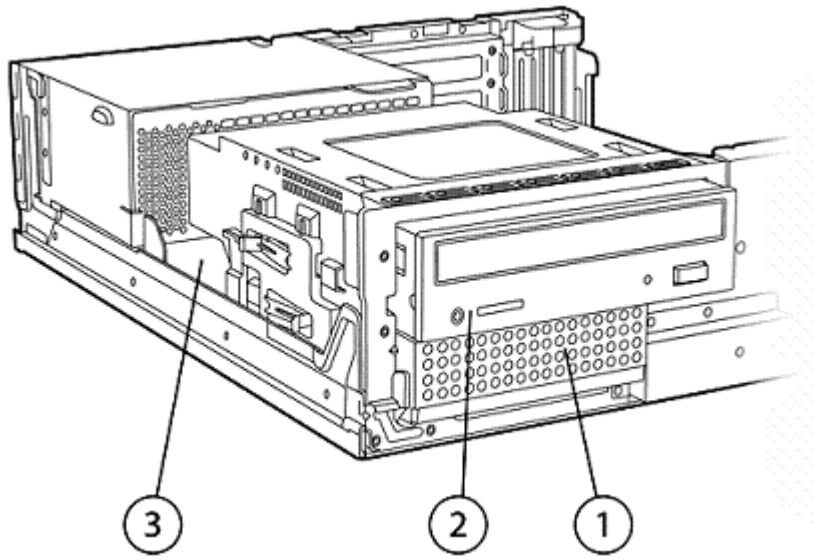
Supports up to 16 GB of DDR3 SDRAM using DIMM modules. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

NOTE:
For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

Total Memory	Slot			
	Channel A		Channel B	
	1 (black)	2 (white)	3 (white)	4 (white)
1 GB	1 GB			
2 GB (dual channel symmetric)	1 GB		1 GB	
4 GB (dual channel symmetric)	1 GB	1 GB	1 GB	1 GB
8 GB (dual channel symmetric)	2 GB	2 GB	2 GB	2 GB
16 GB (dual channel symmetric)	4 GB	4 GB	4 GB	4 GB

NOTE: The Intel Q67 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the POS System contains a single SO-DIMM, 16 MB of memory is pre-allocated for it at system startup. If the POS System contains two SO-DIMMs, 32 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.

Standard Features and Configurable Components (availability may vary by country)



Front View	Quantity Supported	Position	Controller
3.5-inch SATA Hard Drive	3	1, 2*, 3	SATA
Optical Drive Bay or Carrier for Hard Drive	1	2	SATA

External HDD can be connected through optional external ESATA port. 3 Drive maximum

NOTE: When ESATA is installed, either the 2nd HDD (if applicable) or ODD (if applicable) cannot be used.

* For CRU Removable storage in lieu of ODD

Data Storage Drives

250-GB Hard Disk Drives

HP 250-GB SATA 3.0 Hard Disk Drive (3.5")
7,200 rpm, 8MB cache, 6.0 GB/s, NCQ, Smart IV

HP 250-GB SATA 3.0 Removable Hard Disk Drive
7,200 rpm, 8MB cache, 6.0 GB/s, NCQ, Smart IV

500-GB Hard Disk Drives

HP 500-GB SATA 3.0 Hard Disk Drive
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

HP 500-GB SATA 3.0 Removable Hard Disk Drive
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

1-TB Hard Disk Drives

HP 1 TB SATA 3.0 Hard Disk Drive
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

Solid State Drives

HP 120-GB 2.5" SSD

HP 128-GB 2.5" SSD

HP 160-GB 2.5" SSD

Optical Disc Drives

HP DVD-ROM Drive[1]

HP SuperMulti DVD Writer Drive[2]

HP Blu-ray Writer Drive[3]

[1] For playing DVDs
[2] For writing CDs and DVDs, video editing and authoring DVDs, Roxio Business Creator 10
[3] For writing CDs and DVDs, video editing and authoring DVDs, Corel WinDVD 8

Media Card Readers

HP 22-n-1 Media Card Reader

Security Solutions and Capabilities

Trusted Platform Module (TPM) 1.2[1]

Stringent security (via BIOS)[2]

SATA port disablement (via BIOS)

Drive lock

RAID configurations

HP ProtectTools Security Software Suite

Serial, parallel, USB enable/disable (via BIOS)

Optional USB Port Disable at factory (user configurable via BIOS)

Power Configurable Serial Ports (COM 1, 2, 3 and 4) via the HP BIOS
Removable media write/boot control

Power-On password (via BIOS)

Setup password (via BIOS)

HP Hood Sensor

TPM 1.2 Embedded Security Chip* integrated with Broadcom NIC

HP ProtectTools Security Software Suite with BIOS Configuration (serial (all 4), parallel, USB enable / disable), Credential Manager, Smart Card Manager (sold separately)

Three (3) port 12 Volt USB + PWR Card (sold separately)

Two (2) port Power Configurable RS232 Serial Card COM 3 & 4 (sold separately)

Wall Mount (sold separately)

HP Desktop Security Lock Kit (lock and cable) (sold separately)

Security Cable with Kensington lock (sold separately)

HP Rear Port/Cable Control Cover (sold separately)

[1] TPM module disabled where use is restricted by law; for example, Russia.
[2] This setting is defaulted to disable, but when enabled, the PW jumper will not clear the BIOS pre-boot authentication passwords.
NOTE: TPM module disabled where use is restricted by law; for example, Russia.

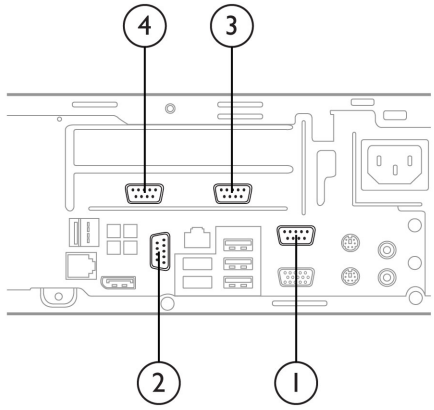
Standard Features and Configurable Components (availability may vary by country)

I/O Ports

USB 2.0	Front: Two (2), covered Rear: Five (5)
USB 24V	One (1) 24V powered USB
Serial	Two (2) RS-232 (power configurable) ports standard
Parallel	One port available as an option*
eSATA	One port available as an option*
RS-232	Two (2) RS-232 powered configurable ports optional (for a total of 4*)
USB+PWR 12V	Two (2) USB+PWR 12V cards optional (three (3) 12 Volt USB+ PWR per card) for a total of 6*
PS/2	One (1) color-coded support for keyboard (purple) One (1) color-coded support for mouse (green)
RJ-11	One (1) RJ-11 Cash Drawer port
Video	One (1) VGA One (1) DisplayPort v1.1a Provides integrated dual independent monitor support
DVI output	Available via optional DisplayPort to DVI Adapter
Audio	Rear: Line input (supports microphone or line input) and line out All ports are 3.5mm in diameter **NOTE:** See Audio/Visual section for information on re-taskable audio ports
NIC	One (1) Industry standard RJ-45 port accesses the integrated network interface controller

*These options occupy slot openings so less slots will be available when the options are installed

Serial Ports (Power Configurable in HP Bios) – detail



1 and 2: Powered Configurable serial port expansion card installation that supplies two additional serial ports (COM3 and COM4)
3 and 4: Two Power Configurable serial ports, COM1 and COM 2, are standard on the POS System.

Standard Features and Configurable Components (availability may vary by country)

Slots

Full-Height	Total of Two (2) Full-Height Slots, with a ***Choice of either***: 1.) PCI - Two (2) each: 4.2" full height, 6.6" length, 25W max. power 2.) PCIe x1 - Two (2) each: 4.2" full height, 6.6" length, 10W max. power
Half-Height	Total of Two (2) Half-Height: PCI Express x1 - One (1) each: 2.5" low profile, 6.6" length, 10W max. power PCI Express x 16 - One (1) each: 2.5 low profile, 6.6" length, 25W max. power

Bays

External	1 each 5.25”, 5.7” depth
Internal HDD	2 each 3.5”

Controllers

Hard drive	SATA Supports up to SATA 6.0 Gb/s
SATA interfaces	One (1) SATA 2.0 Two (2) SATA 3.0
Host SATA	Advanced Host Controller Interface (AHCI) Revision 1.2. The specification includes a description of the hardware/software interface between system software and the host controller hardware

Network Interface Connections

Intel 82579LM (integrated) GbE Network Connection

Intel PRO 1000 CT GbE NIC Card (PCIe x1) (optional)

NOTE: The integrated network connection is required to support Intel vPro Technology

Communications

HP WLAN NIC 802.11 b/g/n 1x2 PCIe Card

2006 LSI PCIe x1 56K International SoftModem (optional)

Standard Features and Configurable Components (availability may vary by country)

Graphics

Intel HD Graphics (integrated)
AMD FirePro 2270
Nvidia Quadro NVS 300 Graphics (PCIe x16)

HP DisplayPort to DVI-D Adapter
HP DisplayPort to HDMI Adapter
HP DisplayPort to VGA Adapter

Multi-Media

High Definition Audio (integrated) with Realtek ALC261 codec (all ports are stereo)
Line-out and Line-In rear Ports (3.5mm)
Internal Speaker (standard)

Input/Output Devices

HP PS/2 Standard Keyboard
HP USB Standard Keyboard
HP USB and PS/2 Washable Keyboard
HP PS/2 Optical Mouse
HP USB Optical Mouse
HP USB Laser Mouse
HP USB and PS/2 Washable Mouse

Miscellaneous Devices and Configurations

HP FireWire (IEEE 1394) PCIe x1 Card
HP Parallel Port Adapter
HP eSATA Port Adapter
HP Tower Stand
HP Rear Port/Cable Control Cover
rp5800 50C Thermal Kit
rp5800 PCI Riser Assembly
rp5800 PCIe Riser Assembly
Three (3) port 12 Volt USB + Pwr Card
Two (2) port RS232 Serial (power configurable) COM 3 & 4 port card

After-Market Options (availability may vary by region)

Communication Devices

	Part #
Intel Gigabit CT Desktop NIC (PCIe x1)	FH969AA
Broadcom NetXtreme GbE Ethernet Plus NIC (PCIe x1)	FS215AA
HP Wireless 802.11 b/g/n NIC (PCIe x1)	FH971AA

NOTE:
The use of a discrete network interface connection card (wired or wireless) will disable the vPro Technology features.

Graphics Solutions

	Part #
AMD FirePro 2270	QK551AA
Nvidia Quadro NVS 300 Graphics (PCIe x16)	BV456AA
HP DMS-59 to Dual DVI Adapter	DL139A
HP DMS-59 to Dual DisplayPort Adapter	XP688AA
HP DisplayPort Cable Kit	VN567AA
HP DisplayPort To Dual Link DVI-D Adapter	NR078AA
HP DisplayPort To DVI-D Adapter	FH973AA
HP DisplayPort to HDMI Adapter	BP937AA
HP DisplayPort to VGA Adapter	AS615AA

Hard Disk Storage Drives

	Part #
HP 500GB SATA (6.0Gb/s) Hard Disk Drive	QK554AA
HP 1TB SATA (6.0Gb/s) Hard Disk Drive	QK555AA
HP 128-GB Solid State Drive	QV063AA
HP 160-GB Solid State Drive	QV064AA
HP eSATA Adapter	FH966AA
HP Removable SATA Hard Drive Enclosure (frame & carrier)	RY102AA
HP Removable SATA Hard Drive Enclosure (carrier only)	RY103AA

After-Market Options (availability may vary by region)

Input / Output Devices

	Part #
HP PS/2 Standard Keyboard	DT527A
HP USB Standard Keyboard	DT528A
HP 2-port Powered Serial Port Card	QP906AA
HP 3-port 12 Volt Powered USB Port Card	QP905AA
HP USB Washable Keyboard	VF097AA
HP USB and PS/2 Washable Mouse	BM866AA
HP USB and PS/2 Washable Keyboard and Mouse Kit	BU207AA
HP PS/2 Optical Mouse	EY703AA
HP USB Optical Mouse	DC172AT
HP USB Laser Mouse	GW405AT
HP rp5800 PCI Riser Assembly	QP907AA
HP rp5800 PCIe x1 Riser Assembly	QP908AA

System Memory

	Part #
HP 2 GB DDR3-1333 MHz DIMM	AT024AA
HP 4 GB DDR3-1333 MHz DIMM	VH638AA
HP 2 GB DDR3-1600 MHz DIMM	B4U35AA
HP 4 GB DDR3-1600 MHz DIMM	B4U36AA

Multimedia Devices

	Part #
HP DVD-ROM Drive	AR629AA
HP SuperMulti Drive	QS208AA
HP Blu-ray Writer Drive	B4F70AA

Removable Media Storage

	Part #
HP 22-n-1 Media Card Reader	AR941AA

After-Market Options (availability may vary by region)

Security Devices

	Part #
HP Chassis Security Kit	AR639AA
HP Business PC Security Lock	PV606AA
HP Wall Mount/Security Sleeve	VN570AA
HP Keyed Lock Cable	BV411AA

Accessories

	Part #
HP rp5800 Trim Bezel – with ODD Opening	QP910AA
HP Integrated Work Center Stand	GN783AA
HP Tower Stand	VN569AA
HP Parallel Port Adapter	KD061AA
HP FireWire (IEEE 1394) Card	PA997A
HP SuperSpeed USB 3.0 Card	BM867AA
HP Rear Port / Cable Control Cover	QP909AA

Retail Solutions Specific Accessories

	Part #
HP Standard Duty Cash Drawer	QT457AA
HP Heavy Duty Cash Drawer	FK182AA
HP Till with Locking Cover	QT458AA
HP Flip-Top Cash Drawer	BW867AA
HP Flip-Top Till with Locking Cover	BZ335AA
HP Imaging Barcode Scanner	BW868AA
HP Linear Barcode Scanner	QY405AA
HP Presentation Barcode Scanner	QY439AA
HP POS Pole Display	FK225AA
HP Graphical Pole Display	QZ704AA
HP Mini MSR with Brackets	FK186AA
HP POS Keyboard without MSR	FK221AA
HP POS Keyboard with MSR	FK218AA
HP Powered USB Thermal Receipt Printer	FK224AA
HP Serial/USB Thermal Receipt Printer	BM476AA
HP Hybrid Printer with MICR	FK184AA
HP USB Y Cable (for Serial USB Receipt Printer)	BM477AA
HP Cable Pack for Dual Cash Drawers	QT538AA
HP L5006tm 15-inch LCD (SAW) Touchscreen Monitor	RB146AA
HP L5009tm 15-inch LCD (APR) Touchscreen Monitor	VK202AA

After-Market Options (availability may vary by region)

HP L1506x 15-inch LED Monitor (Non-Touchscreen)	LL543AA
HP L6010 10.4-inch Monitor (Non-Touchscreen)	A1X76A
HP Dual Position Stand for L6010	A1X79AA
HP L6015tm 15-inch (PCAP) Touchscreen Monitor	A1X78A
HP L6017tm 17-inch (PCAP) Touchscreen Monitor	A1X77A
HP Height Adjusting Stand for L6015/17tm	A1X81AA
HP Retail Integrated Fingerprint Reader	QZ672AA
HP Retail Integrated Webcam	QZ673AA
HP Retail Integrated Dual-Head MSR	QZ700AA
HP rp5800 Terminal Enclosure Assembly	QQ971AA
HP rp5800 Integration Tray Assembly	QQ972AA
HP Display Pole Mount Assembly	QQ973AA
HP Optional Display Arm Assembly	QQ974AA

Weights & Dimensions

(configured with 1 HDD & 1 ODD)

Chassis (H x W x D)	3.95 x 13.3 x 14.9 in 100 x 338 x 379 mm
System Volume	782.77 cu in 13.0 L
Tower Stand (H x W x D)	1.1 x 7.0 x 7.9 in 29 x 178 x 200 mm
Packaging (H x W x D)	9.0 x 19.7 x 23.4 in 229 x 500 x 594 mm
System Weight*	15.08 lb 6.84 kg
Shipping Weight*	16.28 lb 7.34 kg
Max Supported Weight (desktop orientation)	77.0 lb 35.0 kg

Unit Environment and Operating Conditions

General Unit Operating Guidelines

- Keep the POS System away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2-cm (4-in) clearance on front side and power supply side of the POS System to permit the required airflow.
- If within an enclosure, the front side should be 100% open. The clearance between the system and the cabinet must be at least 10 mm (0.4 inch) on the sides and top and at least 50-mm (2-inch) clearance in the rear with power supply venting area 100% open per the above bullet.
- Never restrict airflow into the POS System by blocking any vents or air intakes.
- Do not stack POS Systems on top of each other or place POS Systems so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the POS System. Lint, dust and other foreign matter can block the vents and limit the airflow.

Temperature Range	Operating: 32° to 104° F (0° to 40° C)* Non-operating: -22° to 149° F (-30° to 65° C)
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 0% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)

* Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.
NOTE: An optional thermal configuration is available to support 50C ambient temperatures. This is a factory configurable configuration only.

Technical Specifications

Power Supply	240-watt – EPA90 power supply – Active PFC *This power supply meets ENERGY STAR compliance in conjunction with a select range of processors and modules.
Operating Voltage Range	90 to 264 VAC
Rated Voltage Range	100 to 240VAC
Rated Line Frequency	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz
Rated Input Current	4A Efficiency 87/90/87% at 20/50/100% load
Power Supply Fan	80 mm variable speed fan
ENERGY STAR Compliant	ENERGY STAR 5.0 compliant
Power Cord Length	6.0ft (1.8 3m)
Current Leakage (NFPA99)	< 275 µA

ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP rp5800 Retail System into retail, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Select models feature either Intel Standard Manageability or vPro Technology.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Computrace agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP rp5800 Retail System in any retail environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP the HP rp5800 Retail Systems, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP rp5800 Retail System BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website

Additional HP BIOS Features

- Power-On password – Helps prevent an unauthorized user from powering on the system.
- Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP rp5800 Retail Systems use ACPI to provide power conservation features.
- S5 Max Power Savings setting supports EU Lot6 requirement and allows the HP rp5800 Retail System to power down below 1W is S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.

Other Features

- Advanced Configuration and Power Management Interface (ACPI). Allows the system to wake from a low power mode. Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
- System Management BIOS v2.6
- Intel Wired for Management support; industry wide initiative to make Intel architecture based Retail Systems, PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network
- Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button

Serviceability Features

- Dual colored power LED on front of the HP rp5800 Retail System to indicate either normal or fault condition
- Indicator Lights on front of system:

Power / Diagnostic LED	Hard Drive LED
NIC Link LED	NIC Activity LED

- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 2-second pause, then repeats:
    - 2 – processor thermal protection activated
    - 3 – processor not installed
    - 4 – power supply failure
    - 5 – memory error
    - 6 – video error
    - 7 – PCA failure (ROM detected failure prior to video)
    - 8 – invalid ROM, bootblock recovery mode
    - 9 – system not fetching code
    - 10 – system hang while loading an option ROM
- System/Emergency ROM
- NIC Link and activity LED's on front bezel
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber) - Rear
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power button
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, Optical Drive Removal

NOTE: thumb screw release mechanism is used with the Ultra-slim Desktop chassis cover.

Additional Features	Description
Intel® Standard Manageability	• Requires the utilization of the integrated network connection • Delivered with processors that are not part of the Intel Stable Intel Platform Program (SIPP) • Intel Advanced Management Technology (AMT) v3.2 • Basic Retail SYSTEM management capabilities such as asset inventory, HW alerting, SOL/IDE-R, remote configuration, agent presence and system defense. • DASH 1.1 compliance. Support for profile updates. • Host VPN support for local management VPN tunneling Intel Standard Manageability includes features of Intel Active Management Technology (Intel AMT). Intel AMT requires the Retail system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. For more information, see http://www.intel.com/technology/platform-technology/intel-amt/.
DASH 1.1 support (Desktop and Mobile Architecture for System Hardware)	A standards initiative for representing out-of-band management capability for Retail Systems. It is a secure, web-services based successor to ASF.
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments
TXT (Trusted Execution Technology) and VT-d (Virtualized devices)	TXT allows for secure management (via TPM) and measured launch of VMM, as well as teardown of secrets in unexpected reset case. TXT support provided in select Intel processors VT-d is a chipset technology that virtualizes directed I/O Together, TXT and VT-d may be used to support verified launch of a known trusted VMM that also may protect VMs from accessing each other's memory.
Computrace	Computrace agent support standard
Towerable Orientation	The chassis can be oriented as either a desktop or a tower.
Drive Protection System	DPS Access through F10 Setup during Boot A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the Retail System's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted
SMART I – Drive Failure Prediction	Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count
SMART II – Off-Line Data Collection	By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure
SMART III – Off-Line Read Scanning with	IOEDC: I/O Error Detection Circuitry

Technical Specifications

Detect Reallocation	Detects errors in Read/Write buffers on HDD cache RAM
SMART IV – End-to-End CRC for hard drives	Interface in F10 setup provides confirmation of SMART IV support.

Technical Specifications - Audio

High Definition Audio

Type	Integrated
HD Stereo Codec	Realtek 2-channel ALC261 codec
Audio I/O Ports	Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load) Line-in and Line-out, both on rear. All ports are 3.5mm in diameter
Internal Speaker Amplifier	1.5W amplifier for the internal speaker only. External speakers must be powered externally. Rear Line-in audio port is re-taskable as either Line-in or Microphone-In.
Multi-streaming Capable	Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks.
Sampling	8 kHz – 192 kHz
Wavetable Syntheses (software)	Yes – Uses OS soft wavetable
Analog Audio	Yes
# of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
Internal Speaker	Yes
External Speaker Jack (Line-Out)	Yes

Intel 82579LM GbE Network Connection (integrated)

Connector	RJ-45	
System Interface	Integrated on PCA	
Controller	Intel 82579LM gigabit platform LAN connect networking controller	
Memory	24 KB FIFO packet buffer memory	
Data rates supported	10/100/1000 Mbps	
Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3 ab and 802.3u compliant	
Bus architecture	GLCI, LCI interface. Intel specific MAC to PHY interface	
Data transfer mode	At gigabit GLCI (Intel proprietary 802.3 series-based interface) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.	
Data rates supported	10/100/1000 Mbps	
Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3ab and 802.3u compliant	
Bus architecture	GLCI, LCI interface. Intel specific MAC to PHY interface	
Data transfer mode	At gigabit GLCI (Intel proprietary 802.3 series-based interface) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.	
Power requirement	Requires 3.3V,1.9/1.8V and 1.0V or just 3.3V with integrated regulators Power consumption 1.3 Watts for 82567 whole LOM	
ACBS	Intel Auto Connect Battery Saving feature	
Boot ROM support	Yes	
Network transfer mode	Full-duplex	
	Half-duplex (not supported for the 1000BASE-T transceiver)	
Network transfer rate	10BASE-T (half-duplex)	10 Mbps
	10BASE-T (full-duplex)	20 Mbps
	100BASE-TX (half-duplex)	100 Mbps
	100BASE-TX (full-duplex)	200 Mbps
	1000BASE-T (full-duplex)	2000 Mbps
Environmental	Operating Temperature:	32° to 131°F (0° to 55° C) To 70° C for external regulator
	Operating Humidity:	85% at 131° F (55° C)
Management	WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic.	
Alerting	ASF 2.0 support, AMT 3.0 support	

Technical Specifications - Communications

Intel Gigabit CT Desktop Network Interface Controller (AMO)

Connector	RJ-45	
System Interface	PCI Express x1	
Controller	Intel WG82574L Gigabit Ethernet Controller	
Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers	
Data rates supported	10/100/1000 Mbps	
Compliance	IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
Bus architecture	PCI Express 1.0a	
Data path width	X1, 250 MB/s, Bi-directional interface	
Data transfer mode	Bus-master DMA	
Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
Power requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T	
Boot ROM support	Yes	
Network Transfer Rate	10BASE-T (half-duplex)	10 Mbps
	10BASE-T (full-duplex)	20 Mbps
	100BASE-TX (half-duplex)	100 Mbps
	100BASE-TX (full-duplex)	200 Mbps
	1000BASE-T (full-duplex)	2000 Mbps (actual rate limited by PCI Bus)
Environmental	Operating Temperature:	32° to 131°F (0° to 55° C)
	Operating Humidity:	85% at 131° F (55° C)
Dimensions	4.75 x 2.25 x 0.8 in (12.1 x 5.7 x 2.0 cm)	
Management	WOL, PXE, DMI, WFM 2.0	

HP 802.11 b/g/n Wireless Network Connection

Dimensions (L x H)	3.3 x 4.7 in 8.5 x 12 cm	
Weight	0.08 lbs 40 g	
Controller	Ralink RT2790	
System interface	PCI Express x1	
Network standard	802.11 b/g/n	
Frequency band	2.400 - 2.497 GHz	
Operating temperature	14° to 149°F, operating (-10° to 65°C, operating)	
Storage temperature	-40° to 176°F, non-operating (-40° to 80°C, non-operating)	
Humidity	10-90% operating 5-95% non-operating	
Operating voltage	3.3V +/- 9% 12V +/- 8%	
Power Consumption	**Platform/WLAN Mode**	**Power Consumption**
	Maximum Power Consumption:	10 Watts

Technical Specifications - Communications

	Transmit Only	4 Watts maximum averaged power over 1 second
	Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer
	Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second
	Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second
	Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second
	Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second
Output Power (approximate)	802.11b mode	+19 dBm +/- 1.0 dB maximum
	802.11g mode	+17 dBm +/- 1.0 dB maximum
	EWC mode	+17 dBm +/- 1.0 dB maximum (total power in all transmit chains)

Receive Sensitivity	**Mode**	**Data Rate**	**Sensitivity**
	802.11b	1 Mbps	-94 dBm
	802.11b	11 Mbps	-85 dBm
	802.11g	6 Mbps	-91 dBm
	802.11g	18 Mbps	-85 dBm
	802.11g	48 Mbps	-75 dBm
	802.11g	54 Mbps	-72 dBm
	EWC (2.4 GHz)	6.5 Mbps	-87 dBm
	EWC (2.4 GHz)	54 Mbps	-82 dBm
	EWC (2.4 GHz)	81 Mbps	-78 dBm
	EWC (2.4 GHz)	162 Mbps	-74 dBm
	EWC (2.4 GHz)	270 Mbps	-68 dBm
	EWC (2.4 GHz)	300 Mbps	-64 dBm

Data Transfer Rate	**Data Rate (MCS)**	**Minimum Throughput**
	1 Mbps (802.11 b)	700 kbps
	2 Mbps (802.11 b)	1.4 Mbps
	5.5 Mbps (802.11 b)	3.5 Mbps
	11 Mbps (802.11 b)	5.9 Mbps
	12 Mbps (802.11 g)	6 Mbps
	18 Mbps (802.11 g)	9 Mbps
	24 Mbps (802.11 g)	12 Mbps
	36 Mbps (802.11 g)	18 Mbps
	48 Mbps (802.11 g)	21 Mbps
	54 Mbps (802.11 g)	22.5 Mbps
	6.5 Mbps (20 MHz EWC)	4.5 Mbps
	13 Mbps (20 MHz EWC)	9 Mbps
	19.5 Mbps (20 MHz EWC)	13.5 Mbps

Technical Specifications - Communications

	26 Mbps (20 MHz EWC)	18 Mbps
	39 Mbps (20 MHz EWC)	27 Mbps
	52 Mbps (20 MHz EWC)	36 Mbps
	58.5 Mbps (20 MHz EWC)	40 Mbps
	65 Mbps (20 MHz EWC)	45 Mbps
	78 Mbps (20 MHz EWC)	54 Mbps
	104 Mbps (20 MHz EWC)	72 Mbps
	117 Mbps (20 MHz EWC)	81 Mbps
	130 Mbps (20 MHz EWC)	91 Mbps
	13.5 Mbps (40 MHz EWC)	8 Mbps
	27 Mbps (40 MHz EWC)	16 Mbps
	40.5 Mbps (40 MHz EWC)	24 Mbps
	54 Mbps (40 MHz EWC)	32 Mbps
	81 Mbps (40 MHz EWC)	48 Mbps
	108 Mbps (40 MHz EWC)	64 Mbps
	121.5 Mbps (40 MHz EWC)	72 Mbps
	135 Mbps (40 MHz EWC)	81 Mbps
Security	IEEE and WiFi compliant 64 / 128 bit WEP encryption AES: CCM 802.1x authentication WPA: 802.1x. WPA-PSK and TKIP WPA2 certification IEEE 802.11i Cisco Certified Extensions, all versions through V5	
Antenna	HP part number 497792-001	
Certifications	Wi-Fi certified	
Certifications for use by country	United States, Canada, Peru, Taiwan	

Intel HD Graphics (integrated)

3D/2D Controller	Microsoft DirectX 10.1 based with support for Pixel Shader 4.1
VGA Controller	Integrated
DisplayPort	v1.1a; integrated, multimode capable; supports HDCP and audio over DisplayPort
Bus Type	PCI Express x16
RAMDAC	Integrated, 350 MHz
Memory	Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed, BIOS settings, operating system, and system load. 32 MB is pre-allocated for graphics use at system boot time. Additional memory can be allocated at boot time by the BIOS for PAVP (Protected Audio Video Playback) support for playback of protected video content. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use.
HW Video Decode	Hardware Accelerated decode for MPEG2 encrypted video; support for PAVP
Maximum Color Depth	32 bits/pixel
Maximum Vertical Refresh Rate	85 Hz at up to 1920x1440, 75 Hz at 2048x1536. Varies with mode and configuration. See table below.
Multi-display Support	Integrated dual independent monitor support facilitated via one VGA port and one DisplayPort v1.1a integrated on the back plane of the system board and presented as part of the rear I/O set of interfaces. Support for DVI, HDMI, dual link DVI or second VGA monitor provided by optional HP DisplayPort adapters. The system can support greater than two monitors with the addition of an optional discrete graphics card. Both integrated graphics and discrete graphics can be utilized simultaneously.
Graphics/Video API Support	Microsoft DirectX 10.1, OpenGL 3.0

Resolutions Supported

	Maximum Refresh Rate	
Resolution	**Analog Connection**	**Digital Connection**
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a DisplayPort connection

NOTE:
Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

NOTE:
60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

NVIDIA NVS 300 PCIe Graphics Card

Form Factor	Dimensions Low-profile, 2.586 x 5.7 in (6.57 x 14.48 cm
Graphics Controller	Nvidia GT218 GPU
Bus Type	PCIe x16
Memory	512 MB DDR3
Connectors	DMS-59 Connector
Board Display Options	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual single-link DVI-I connectors cable kit part number: DL139A
Multi-monitor support	Dual analog or digital (Single Link DVI) monitors (DVI support requires optional DVI cable kit DL139A)
Supported Graphics APIs	OpenGL 3.3 support in hardware for optimal performance with OpenGL applications DirectX 10.1 support in hardware for optimal performance in DX10 applications

Resolution	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
2048x1536	85	N/A
1920x1440	75	N/A

NOTE:
60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

Technical Specifications - Graphics

AMD FirePro 2270 512MB Graphics Card

Form Factor	Low Profile, Half Length, 2.3" x 6.6"
Graphics Controller	AMD FirePro™ 2270 Professional Graphics
Bus Type	PCI Express™ x16 Generation 2.0
Memory	512MB DDR3
Connectors	DMS-59 connector to support breakout cables for dual DisplayPort, DVI and VGA output. DMS-59 to VGA adapter included. (Dual Display Port and Dual DVI adapters sold separately)
Maximum Resolution	Digital 2560x1600 (DisplayPort) Analog 1920x1200 (DVI 60 Hz/ VGA 75Hz)
RAMDAC	400 MHz DAC, 10-bit per channel
Display Output	Power two 30" high resolution displays
Supported Graphics APIs	DirectX 11 and OpenGL 4.0

HP DisplayPort to DVI-D Adapter

Connectors	DisplayPort and DVI-D single link connector
Adapter length	7.5 in (19.0 cm)
Adapter weight	.10 lbs (.05 kg)

HP DisplayPort to VGA Adapter

Connectors	DisplayPort and VGA connector
Adapter length	8 in (20 cm)
Adapter weight	.1 lbs (.06 kg)
Max. vertical refresh rate	85 Hz
Display support	162 MHz RAMDAC
Display max resolution	1600x1200

Resolutions Supported

Resolution	Max refresh rate
640x480	85
800x600	85
1024x768	85
1280x720	85
1280x1024	85
1440x900	75
1600x1200	60
1680x1050	60
1920x1080	60-R
1920x1200	60-R

NOTE:
Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP. Using the HP DisplayPort to VGA Adapter may require an update to the graphics driver installed on your system. To install the most up-to-date graphics driver go to: www.hp.com.

NOTE:
60-R denotes reduced blanking timings are used. Not all monitors support reduced blanking timing.

Introduction:

HP Serial Advanced Technology Attachment (SATA) Hard Drives maximize the performance of HP Retail Systems by providing the technologies to meet your increasing storage demands with high-capacity drives offering superior reliability and performance.

SATA provides faster data transfer speeds, better system cooling airflow, more bandwidth, more headroom for speed increases in future generations and better data integrity. A next-generation technology, the SATA interface connects hard drives to the Retail System platform enabling easy aggregation of multiple hard drives into a single Retail System. This offers you the additional benefits of dedicated bandwidth, the ability to more easily identify device failures and scalability. The HP rp5800 Retail System supports the latest SATA 6.0Gb/s specification.

HP Drive Lock

HP Serial ATA Hard Drives offer enhanced security via a new Drive Lock. When enabled, this ATA security feature set prevents software access to user data on the drive until one or two user-defined passwords are provided.

SMART IV Technology

Self Monitoring Analysis and Reporting Technology (SMART) hard drive technology allows hard drives to monitor their own health and to raise flags if imminent failures are predicted. If the drive determines that a failure is imminent, the SMART hard drive technology enables the intelligent manageability or management software to generate a fault alert. While the current versions of SMART hard drives do a good job monitoring the data on the hard drive media, the ever increasing emphasis on reliability and quality has promoted HP to implement SMART IV technology which constantly checks that the data flow from host interface to media and media to host interface is not compromised. This is accomplished by inserting a 2 byte parity code into every 512 byte block in the data path of the hard drive's Cache RAM. This unique parity checking performed by HP's SMART IV technology hard drives, allows for more complete error detection coverage encompassing the entire data path between the host and the hard drive.

Smart IV is also known as IOEDC: I/O Error Detection Code.

Native Command Queuing

NCQ or Native Command Queuing is a SATA protocol extension that allows the hard drive to have several write or read commands outstanding at the same time. In contrast, normal non-queued operation requires each command to be completed before the next command is issued by the host system. Queuing allows the drive to complete the commands in the order that allows for best overall throughput. It also involves an advanced method of transferring data to or from the host, called First Party Direct Memory Access (FPDMA), which allows the hard drive and the host controller to manage the data transfers for multiple outstanding commands, without involving the host processor. NCQ can contribute to better performance but the results are dependent on many factors, including the access patterns of the various applications and operating system functions that are initiating drive accesses. Enabling NCQ features in the hard drive requires AHCI support from the host system BIOS, controller, and driver. AHCI support is typically implemented in RAID configurations.

NOTE: GB = 1 billion bytes. Actual available capacity is less.

Technical Specifications - Data Storage Drives

HP Solid State Drives

Unformatted Capacities	128-GB and 160-GB	
Architecture	Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller	
Interface	Serial ATA (SATA)	
Dimensions (W x H x D)	2.74 x 0.37 x 4 in/6.98 x 0.95 x 10.2 cm	
Weight	0.18 lb/80 g	
Bandwidth Performance	**Sustained Sequential Read:**	Up to 250 MB/s
	Sustained Sequential Write:	Up to 70 MB/s
	Random Read:	Up to 35K IOPs
	Random Write:	Up to 6.6K IOPs
Latency	**Read:**	65-ms
	Write:	85-ms
Power	**DC power requirement:**	5 VDC 5%-100 mV ripple p-p
	Total power consumption:	0.15W (active); 0.075W (idle)
Useful Drive Life	35TB written, up to 20GB/day for 5 years	
Environmental (all conditions, non-condensing)	**Operating Temperature:**	32° to 158° F (0° to 70° C)
	Relative Humidity:	5% to 95%
	Maximum Wet Bulb Temperature (operating):	84° F (29° C)
	Shock:	1,500 G/0.5-ms

NOTE:
For solid state disk drives, GB means 1 billion bytes. 16GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity varies by content and will be less than 15.8GB.

HP 250-GB Hard Disk Drive (3.5”)

Capacity	250,059,350,016 bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	8 MB	
Logical Blocks	488,397,168	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	1.0 ms
	Average:	8.5 ms
	Full-Stroke:	18 ms
Height (nominal)	1 in/2.54 cm	
Width (nominal)	Media diameter: 3.5 in/8.89 cm	
	Physical size: 4 in/10.2 cm	
Operating Temperature	41° to 131° F (5° to 55° C)	

HP 500-GB Hard Disk Drive (3.5”)

Capacity	500,107,862,016 bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	16 MB	
Logical Blocks	976,773,168	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
Height (nominal)	1 in/2.54 cm	
Width (nominal)	Media diameter: 3.5 in/8.89 cm	
	Physical size: 4 in/10.2 cm	
Operating Temperature	41° to 131° F 5° to 55° C	

HP 1-TB Hard Disk Drive (3.5”)

Capacity	1,000,xxxxx bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	16 MB	
Logical Blocks	976,773,168	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
Height (nominal)	1 in/2.54 cm	
Width (nominal)	Media diameter: 3.5 in/8.89 cm	
	Physical size: 4 in/10.2 cm	
Operating Temperature	41° to 131° F 5° to 55° C	

HP Blu-ray Writer Drive

Height	5.25-inch, half-height, tray-load
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Disc capacity	128 GB QL, 100 GB TL, 50 GB DL or 25 GB standard
Dimensions (W x H x D)	5.9 x 1.7 x 7.5 in 15.0 x 4.4 x 19.0 cm
Weight (max)	2.0 lb 907g

Write Speeds		**Single-layer**	**Double-layer**
	BD-R	2x, 4x CLV, 6x CAV	2x, 4x CLV, 6x PCAV
	BD-RE	2.3x	2x CLV
	DVD-R	2x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2x, 4x CLV, 8x PCAV
	DVD-RW	1x, 2x, 4x, 6x CLV	Not supported
	DVD+R	2.4x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2.4x, 4x CLV, 8x PCAV
	DVD+RW	2.4x, 4x, 6x CLV, 8x ZCLV	Not supported
	DVD-RAM	2x, 3x, 5x CLV	
	CD-R	8x,16x CLV, 24x, 32x PCAV, 40x CAV	
	CD-RW	4x, 10x, 16x CLV, 24x ZCLV	

Read Speeds		**Single-layer**	**Double-layer**
	BD-ROM	8x CAV	8x CAV
	BD-R	8x CAV	8x CAV
	BD-RE (SL/DL)	6x CAV	6x CAV
	DVD-ROM	16x CAV	8x CAV
	DVD-R	16x CAV	8x CAV
	DVD-RW	10x CAV	Not support
	DVD+R	16x CAV	8x CAV
	DVD+RW	10x CAV	Not support
	BDMV (AACS Compliant Disc)	8x CAV	

Technical Specifications – Optical Drives and Storage

	DVD-RAM	2x, 3x, 5x CLV
	DVD-Video (CSS Compliant Disc)	8x CAV
	CD-R/RW/ROM	40x / 40x / 40x CAV
	CD-DA (DAE)	32x CAV
	80 mm CD	11.5x CAV
Sustained Transfer rate	**BD-ROM**	35.977 MB/s (8x) max.
	DVD-ROM	22.16 MB/s (16x) max.
	CD-ROM	6,000 KB/s (40x) max.
Buffer Transfer Rates	1.5Gbps bits/s (10b side)	
	1.2Gbps bits/s (8b side)	
Multimedia MPC-3 compliant	Yes	
Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
Power	**Source**	SATA DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum
Environmental (all conditions non-condensing)	**Temperature** (operating)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 90%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)

HP SuperMulti DVD Writer Drive

Height	5.25-inch, half-height, tray-load	
Orientation	Either horizontal or vertical	
Interface type	SATA/ATAPI	
Disc capacity	8.5 GB DL or 4.7 GB standard	
Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
Weight (max)	2.6 lb (1.2 kg)	
Write speeds	**DVD-RAM**	Up to 5X

	DVD+R	Up to 16X
	DVD+RW	Up to 8X
	DVD+R DL	Up to 8X
	DVD-R DL	Up to 8X
	DVD-R	Up to 16X
	DVD-RW	Up to 6X
	CD-R	Up to 40X
	CD-RW	Up to 24X
Read speeds	**DVD-RAM**	Up to 12X
	DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
	DVD-ROM DL	Up to 8X
	DVD-ROM, DVD+R, DVD-R	Up to 16X
	CD-ROM, CD-R	Up to 40X
	CD-RW	Up to 32X
Access time (typical reads, including settling)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
Power	**Source**	SATA DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum) 12 VDC (< 600 mA typical, 1400 mA maximum)
Environmental conditions (operating - non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	86° F (30° C)

HP DVD-ROM Drive

Height	5.25-inch, half-height, tray-load
Orientation	Either horizontal or vertical

Technical Specifications – Optical Drives and Storage

Interface type	SATA/ATAPI		
Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
Weight (max)	2.6 lb (1.2 kg)		
Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 8X	
	DVD-ROM	Up to 16X	
	DVD-RAM	Up to 5X	
	CD-ROM, CD-R	Up to 40X	
	CD-RW	Up to 32X	
Removable Storage - Media Compatibility - DVD-ROM	**Media**	**Read**	**Write**
	CD-ROM	Yes	No
	CD-R	Yes	No
	CD-RW	Yes	No
	DVD-ROM	Yes	No
	DVD-ROM DL	Yes	No
	DVD-RAM	Yes	No
	DVD+R	Yes	No
	DVD+R DL	Yes	No
	DVD+RW	Yes	No
	DVD-R	Yes	No
	DVD-RW	Yes	No
	DVD-R DL	Yes	No
Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	Cache Buffer	2 MB (minimum)	
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
Power	**Source**	SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	

	DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC -< 600 mA typical, < 1400 mA maximum
Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	86° F (30° C)

HP 22-n-1 Media Card Reader

USB Interface	USB 2.0 High-speed interface
	NOTE: Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.
Advance protocol support	Supports hardware ECC (Error Correction Code) function
	Supports hardware CRC (Cyclic Redundancy Check) function
	Supports MS 4-bit parallel transfer mode
	Supports MS-PRO 4-bit parallel transfer mode
	Supports MS PRO-HG Duo 4-bit parallel transfer mode
	Supports SD 4-bit parallel transfer mode
	Supports high-speed 50Mhz SD 4-bit card (version 2.0)
	Supports high-speed 52Mhz MMC 8-bit card (version 4.2)
	Supports CF v4.0 with PIO mode 6 and Ultra DMA mode
Supported media type	CompactFlash Type I
	CompactFlash Type II
	Microdrive
	MultiMediaCard (MMC)
	Reduced Size MultiMediaCard (RS MMC)
	MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC)
	Reduced Size MultiMediaCard 4.2 (MMC Mobile, including MMC Mobile HC)
	Secure Digital Card (SD)
	Secure Digital High Capacity (SDHC)
	miniSD
	miniSD High Capacity

	Micro SD (T-Flash)
	Micro SD HC
	Memory Stick
	Memory Stick Select
	Memory Stick Duo (MS Duo)
	Memory Stick PRO (MS PRO)
	Memory Stick PRO Duo (MS PRO Duo)
	Memory Stick PRO-HG Duo
	MagicGate Memory Stick (MG)
	MagicGate Memory Stick Duo
	xD-Picture Card
Supported media type with card adapter	Memory Stick Micro (M2)
	MMC Micro

HP USB Standard Keyboard

Physical characteristics	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in 45.8 x 16.3 x 2.5 cm
	Weight	2 lb 0.9 kg
Electrical	**Operating voltage**	+ 5VDC ± 5%
	Power consumption	50-mA maximum (with three LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft® PC 99 - 2001	Functionally compliant
Mechanical	**Languages**	38 available
	Keycaps	Low-profile design
	Switch actuation	55-g nominal peak force with tactile feedback
	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence

Technical Specifications - Input/Output Devices

	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	
Kit contents	**Keyboard**	Installation Guide
	Warranty Card	Safety and Comfort Guide

HP PS/2 Standard Keyboard

Physical characteristics	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
	Weight	2 lb (0.9 kg) minimum
Electrical	**Operating voltage**	+ 5VDC ± 5%
	Power consumption	50-mA maximum (with three LEDs ON)
	System interface	PS/2 6-pin mini din connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft® PC 99 - 2001	Functionally compliant
Mechanical	**Languages**	38 available
	Keycaps	Low-profile design
	Switch actuation	55-g nominal peak force with tactile feedback
	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft 1.8 m
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)

	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

HP USB Smart Card (CCID) Keyboard

Introduction:

Boost your security, simplify access procedures and reduce the costs associated with managing networks by preventing unauthorized access to your computers and networks using smartcard technology with the HP Smart Card (CCID) Keyboard.

The USB Smart Card (CCID) Keyboard is a full-sized keyboard that takes advantage of digital signatures and certificates to secure the environment for transactions performed on both public and private networks. The USB Smart Card (CCID) Keyboard works with all smart cards that comply with ISO standard 7816.

Smart cards are easy-to-use credit card-sized devices which require multiple forms of information to be validated before you gain access to your accounts or resources. Used worldwide, smart cards strengthen access to a network or other resource using dual-factor authentication. Implementing a two-factor authentication (or multi-factor authentication) process reduces the risk of unauthorized access by verifying and validating your identity in one of the following ways:

- Something you know – a combination of username and password or PIN
- Something you have – a smart card or security token.

Something you have (smart card) plus something you know (PIN), improves user-access security within corporate network environments. Smart cards are used in government agencies, healthcare companies and the finance industry.

HP ProtectTools Smart Card Manager provides authentication software for the smart card. The Smart Card Reader module works with the HP ProtectTools Security Manager and enables the user to setup, use, and manage the smart card. This allows strengthened security with HP patented technology.

Key Benefits:

- Protects against unauthorized access with smart card technology
- Delivers even greater security when combined with a HP ProtectTools smart card and the HP ProtectTools Security Software
- Combination of username and password or pin with a smart card or security token
- Secures online transactions using digital signatures and certificates
- Conforms to industry standards for ease of setup and use
- Delivers long product life and quiet operation with high-impact materials and lubricated keys
- Spill drain feature

Technical Specifications - Input/Output Devices

Physical Characteristics	**Keys**	104, 105, 106, 107, 109 layout (depending upon country
	Form factor	USB basic smart card keyboard
	Colors	Carbonite/Silver
	Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in 46.3 x 16.1 x 3.3 cm
	Weight	2 lb (0.9 kg) minimum
Electrical	**Operating voltage**	+ 5VDC ± 5%
	Power consumption	100-mA maximum (with four LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC 99 - 2001	Functionally compliant
Mechanical	**Languages**	30+ available
	Keycaps	Standard design
	Switch actuation	55 g nominal peak force with tactile feedback
	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration

Technical Specifications - Input/Output Devices

	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence	
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence	
SmartCard Function	**Support**	All ISO 7816 smart cards	
	Interface	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)	
	Chipset	SCM STCIII	
	Standard APIs supported	PC/SC, EMV2000, CT-API	
	Power	USB Port	
		Short circuit detection (protects smart card and reader)	
		Power supply compliant with ISO7816 and EMV (5V, 60 mA)	
		Supports 3-V and 5-V cards	
	Power consumption	100-mA maximum draw	
	Communication	From card	9600 bps to 330,000 bps
		From computer	12 Mbps (USB transfer speed)
	Landing mechanism	Contact device	Friction contact
		Card insertions rating	Up to 100,000 insertion cycles
	Interface modes	CCID protocol	
	Reader performance interface	USB connection	
	Electro-magnetic standards	Europe	2004/108/EC
		USA	USAFCC part 15
Approvals	CE-Mark, UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, EMV2000, USB-IF		
Ergonomic Compliance	ISO 9241-4, TUVGS		
Kit Contents	Keyboard, I/O Security and Documentation CD, warranty card		
Smart Card Compatibility	HP	HP ProtectTools Smart Card	
	American Express	Amex Blue	
	Axalto (Schlumberger)	Cryptoflex 8K Cryptoflex 16K Cryptoflex 32K Cryptoflex 32K e-gate Cyberflex Access 64K Cyberflex Access 32K Cyberflex 32K e-gate Cyberflex 64K	

	Cyberflex Palmera Payflex-S Payflex 1K Payflex 2K Payflex 4K Payflex 8K Prismera US DoD CAC PrimeFlex Store 8K PrimeFlex Store 2K
Cardlogix	CLXSU004KK4 CLXSU008KK5
Safenet, Inc.	Model 300 Model 330
De-La Rue	VisaCash
Gemplus	Gem Expresso GKK32K Gemclub Memo GemClub Micro GemXplore GemSafe
Infineon	SLE66C322P SLE4406 SLE4406E SLE4406E SE SLE4418 SLE4428 SLE4432 SLE4436E SLE4442 SLE5536
SafLink (Litronic)	Forte
Shart	Java Card
Oberthur	CosmopollC v4 CosmopollC v4.1 Cosmo ID-One GalatIIC v2.1 US DoD CAC
Memory Cards	
Atmel	AT24C01ASC AT24C02SC AT24C04SC AT24C08SC AT24C16SC AT24C32SC

		AT24C64SC AT24C128SC AT24C256SC AT24C512SC AT88SC153 AT88SC1608
	ISSI	IS23SC4418 IS23SC4428
	ST	14C02
	Telefonkarte	SLE4406 SLE4436 SLE5536
	XICOR	X24026

HP USB & PS2 Washable Keyboard

Physical characteristics	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in 45.8 x 16.3 x 2.5 cm
	Weight	2 lb (0.9 kg) minimum
Electrical	**Operating voltage**	+ 5VDC ±5%
	Power consumption	50-mA maximum (with three LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft® PC 99 - 2001	Functionally compliant
Mechanical	**Keycaps**	Stepped -profile design
	Switch actuation	55-g nominal peak force with tactile feedback
	Switch life	20 million keystrokes
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	7 ft 2.2 m
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level

Technical Specifications - Input/Output Devices

Environmental	**Operating temperature**	50° to 122° F 10° to 50° C
	Non-operating temperature	-4° to 149° F -20° to 65° C
	Operating humidity	10% to 95% (non-condensing at ambient)
	Non-operating humidity	0% to 95% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
Approvals	UL, cUL, FCC, CE, TUV GS, VCCI, BSMI, C-Tick, KCC, USB-IF, WHQL, EN/IEC 60601-1, IP66/NEMA4X	
Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

HP PS/2 Optical Mouse

Dimensions (H x L x W)	1.56 x 2.44 x 4.61 in 3.95 x 6.21 x 11.7 cm	
Weight	4.44 oz 126 g	
Environmental	**Operating temperature**	-32° to 104°F 0° to 40° C
	Non-operating temperature	-4° to 140°F -20° to 60° C
	Operating humidity	10% to 90% (non condensing at ambient)
	Non-operating humidity	10% to 90% (non condensing at ambient)
	Operating shock	40 g, 6 surfaces
	Non-operating shock	80 g, 6 surfaces
	Operating vibration	2 g peak acceleration
	Non-operating vibration	4 g peak acceleration
	Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face

Technical Specifications - Input/Output Devices

Electrical	**Operating voltage**	5 VDC ± 10%
	Power consumption	100mA
	System consumption	PS/2 mini-din connector
	ESD	CE level 4, 15 kV air discharge
	EMI-RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC99 - 2001	Functionally compliant
Mechanical	**Resolution**	400 ± 20% DPI
	Tracking speed	10 in/s (25.4 cm/s) maximum
	Acceleration	100 in/s/s (2.54 m/s/s)
	Switch actuation	61 g nominal peak force
	Switch life	3,000,000 operations (using Hasco modified tester)
	Switch type	Low force micro-switches
	Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
	Cable length	6 ft (1.8 m)
	Microsoft PC99 - 2001	Mechanically compliant
Scroll wheel	**Width**	8 mm
	Diameter	1.01 in (25.6 mm)
	Maximum rotation speed	48 rats/sec
	Switch type	Light force micro-switch
	Switch life	1 million operations
	Mechanical life	Minimum 200,000 revolutions
Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	

Technical Specifications - Input/Output Devices

HP USB Optical Mouse

Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in 3.8 x 11.6 x 6.3 cm
Weight	0.27 lb 0.12 kg
Cable length	72.8 in 185 cm
System requirements	Microsoft Windows 95, 98, 2000, Me, XP and Vista Available USB port

HP USB Laser Mouse

Scroll Wheel	24	
Maximum Rotation Speed	48 rats/sec	
Switch Type	Wheel	
Switch Life	Button - 3,000,000	
	Wheel - 1,000,000 times	
	Tilt switch - 500,000 times	
Environmental	**Operating Temperature**	32° to 104° F 0° to 40° C
	Non-operating Temperature	-4° to 140° F -20° to 60° C
	Operating Humidity	10% to 90% (non-condensing at ambient)
	Non-operating Humidity	20% to 80% (non-condensing at ambient)
	Operating Shock	40 g, six surfaces
	Non-operating Shock	80 g, six surfaces
	Operating Vibration	2-g peak acceleration
	Non-operating Vibration	4-g peak acceleration
Electrical	**Operating Voltage**	+ 5VDC ± 5%
	Power Consumption	
	MTBF	> 150,000 hrs
	ESD	IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV

Technical Specifications - Input/Output Devices

	EMI-RFI	FCC Class B
	PC98	PC 99 Compliant
Mechanical	**Resolution**	800dpi
	Tracking Speed	25 cm/sec
	Acceleration	0.5mm
	Switch Actuation	0.6N (60gf)
	Switch Life	Button - 3,000,000
		Wheel - 1,000,000 times
		Tilt switch - 500,000 times
	Cable Length	1850mm
	PC98-99	PC99 compliant
Regulatory Approvals	UL60950-1, UL 94, UL 746 (A-E), UL 796 TUV/GS: EN 60950-1, EN 60825-1 FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL	

Technical Specifications - Environmental Data

Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US ENERGY STAR
- IT ECO declaration
- EPEAT Gold where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	38.55 W	38.62 W	38.42 W
Sleep (Energy Star low power mode)	2.65 W	2.90 W	2.70 W
Off	0.93 W	1.12 W	0.92 W

NOTE:
Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family . HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured model.

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	132 BTU/hr	132 BTU/hr	131 BTU/hr
Sleep	9 BTU/hr	10 BTU/hr	9 BTU/hr
Off	3 BTU/hr	4 BTU/hr	3 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.7	28
Fixed Disk (random writes)	3.8	29

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

Technical Specifications - Environmental Data

Battery size: CR2032 (coin cell)
Battery type: Lithium

Additional formation

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 4.62% post consumer recycled plastic (by wt.)
- This product is 93.7% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
  - Corrugated – 1966 g
- Internal:
  - Polyethylene low density foam – 154 g
- The corrugated packaging material contains at least 38.38% recycled content.
- The Polyethylene low density Foam packaging material contains at least 60.42% recycled content.

RoHS Compliance

Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances will be virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at: http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)

- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
- Nickel finishes that release greater than 0.5 micro-grams/cm^2/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:
Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

Technical Specifications - Environmental Data

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